DAB

FOR THE YEAR ENDING
DECEMBER 31, 1990

SUMMARY OF

NATURAL FLOWS CONSUMPTIVE USE AND STORAGE

IN THE SOUTH SASKATCHEWAN RIVER BASIN

PREPARED BY

ENVIRONMENT CANADA
CONSERVATION AND PROTECTION
INLAND WATERS DIRECTORATE
WATER RESOURCES BRANCH

SUMMARY OF
RECORDED AND NATURAL FLOWS AND DELIVERIES
OF SOUTH SASKATCHEWAN RIVER
BELOW RED DEER RIVER
(UNIT - CUBIC DECAMETRES)
December 1990

Month	Recorded Discharge	Natural Flow	50 Percent Of Natural Flow	Excess (+) Or Deficit (-) Delivery	Cumulative Excess (+) or Deficit (-) Delivery
Jan	309000.	220000.	110000.	+ 199000.	+ 199000.
Feb	216000.	123000.	61500.	+ 154500.	+ 353500.
Mar	466000.	370000.	185000.	+ 281000.	+ 634500.
Apr	713000.	669000.	334500.	+ 378500.	+ 1013000.
May	1045000.	1374000.	687000.	+ 358000.	+ 1371000.
Jun	2976000.	3506000.	1753000.	+ 1223000.	+ 2594000.
Jul	1292000.	2000000.	1000000.	+ 292000.	+ 2886000.
Aug	611000.	995000.	497500.	+ 113500.	+ 2999500.
Sep	246000.	479000.	239500.	+ 6500.	+ 3006000.
Oct	284000.	394000.	197000.	+ 87000.	+ 3093000.
Nov	335000.	312000.	156000.	+ 179000.	+ 3272000.
Dec	201000.	129000.	64500.	+ 136500.	+ 3408500.
TOTALS	8694000.	10571000.	5285500.	+ 3408500.	+ 3409000.

(i) All data is rounded to three significant figures.
(ii) Natural Flow calculations are based on the methodology described in 'Natural Flow Report, South Saskatchewan River Below Red Deer River' March, 1974. (PPWB Report no. 45).
(iii) Apportionment of natural flow in South Saskatchewan River is as specified in Article 4, Schedule A, of the Master Agreement on Apportionment (1969).
(iv) Flows have been routed and as a result, the values presented in the table cannot be exactly balanced on a monthly basis.

SUMMARY OF
RECORDED & NATURAL FLOWS, CONSUMPTIVE USE & STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
(UNIT - CUBIC DECAMETRES)
For The Quarter Ending December 1990

SOUTH SASKATCHEWAN RIVER AT ALBERTA-SASKATCHEWAN BOUNDARY

Month	Recorded Discharge	Consumptive Use	Change in Reservoir Storage	Routing Adjustment	Diversion From Basin	Natural Flow Alta-Sask Boundary
Jan	262000.	1460.	-62930.	-6620.	0.	193910.
Feb	181000.	1790.	-84040.	11000.	0.	109750.
Mar	351000.	4100.	-86450.	620.	0.	269270.
Apr	406000.	57490.	-50040.	-35070.	3160.	381540.
May	816000.	252390.	81260.	-42720.	18250.	1125180.
Jun	2030000.	283830.	253080.	-28940.	30030.	2568000.
Jul	708000.	541870.	131930.	21600.	40820.	1444220.
Aug	382000.	395680.	-38330.	20040.	32220.	791610.
Sep	127000.	324070.	-99730.	4380.	19740.	375460.
Oct	207000.	63070.	-10700.	48590.	12510.	320470.
Nov	298000.	1960.	-28590.	5800.	0.	277170.
Dec	155000.	2040.	-57880.	7990.	0.	107150.
TOTALS	5923000.	1929750.	-52420.	6670.	156730.	7963730.

SUMMARY OF
RECORDED & NATURAL FLOWS, CONSUMPTIVE USE & STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
(UNIT - CUBIC DECAMETRES)
For The Quarter Ending December 1990

RED DEER RIVER AT ALBERTA-SASKATCHEWAN BOUNDARY

Month	Recorded Discharge	Consumptive Use	Change in Reservoir Storage	Routing Adjustment	Diversion Into Basin	Natural Flow Alta-Sask Boundary
Jan	46600.	0.	-21950.	1850.	0.	26500.
Feb	34700.	0.	-21830.	10.	0.	12880.
Mar	115000.	0.	-3970.	-10470.	0.	100560.
Apr	307000.	2930.	-33630.	14740.	-3160.	287880.
May	229000.	4130.	62850.	-29320.	-18250.	248410.
Jun	946000.	2230.	4330.	15540.	-30030.	938070.
Jul	584000.	5070.	4970.	2390.	-40820.	555610.
Aug	229000.	6180.	-1260.	1700.	-32220.	203400.
Sep	119000.	2790.	1860.	-120.	-19740.	103790.
Oct	76900.	440.	8880.	-510.	-12510.	73200.
Nov	36800.	0.	-7800.	5890.	0.	34890.
Dec	45600.	0.	-24850.	1210.	0.	21960.
TOTALS	2769600.	23770.	-32400.	2910.	-156730.	2607150.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of January , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	262000.
Consumptive Use	1460.
Reservoir Storage	-62930.
Routing Adjustment	-6620.
Diversion from Basin	- 0. + 0.
NATURAL FLOW*: Alta-Sask Boundary	193910.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	46600.
Consumptive Use	0.
Reservoir Storage	-21950.
Routing Adjustment	1850.
Diversion into Basin	+ 0. - 0.
NATURAL FLOW : Alta-Sask Boundary	26500.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	308600.
NATURAL FLOW	220410.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchewan River Basin
Month of January , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	1460.
Eastern Irrigation District	0.
Lethbridge Northern Irrig. Dis	0.
Mountain View Et. Al. I.D's	0.
St. Mary River Irrigation Dist	0.
United Irrigation District	0.
Western Irrigation District	0.
TOTAL CONSUMPTIVE USE	1460.

RESERVOIR STORAGE
South Saskatchewan River Basin
Month of January , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	-780.
2.Bearspaw Reservoir	-2570.
3.Ghost Lake	-150.
4.Glenmore Reservoir	-1370.
5.Lake Minnewanka	-9840.
6.Lower Kananaskis	-8070.
7.St. Mary Reservoir	-2090.
8.Spray Lakes	-18900.
9.Upper Kananaskis	-18540.
10.Waterton Reservoir	-620.
TOT. CHANGE IN RESERVOIR STORAGE	-62930.

Diversion Into - Red Deer River Basin
Month of January , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	0.
Western Irrigation District	
WID Ret Flow-Red Deer River	0.
Total Diversion Into Basin	0.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of January , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	0.
TOTAL CONSUMPTIVE USE	0.

RESERVOIR STORAGE
Red Deer River
Month of January , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	-21950.
TOT. CHANGE IN RESERVOIR STORAGE	-21950.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of February , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	181000.
Consumptive Use	1790.
Reservoir Storage	-84040.
Routing Adjustment	11000.
Diversion from Basin	- 0. + 0.
NATURAL FLOW*: Alta-Sask Boundary	109750.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	34700.
Consumptive Use	0.
Reservoir Storage	-21830.
Routing Adjustment	10.
Diversion into Basin	+ 0. - 0.
NATURAL FLOW : Alta-Sask Boundary	12880.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	215700.
NATURAL FLOW	122630.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchewan River Basin
Month of February , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	1790.
Eastern Irrigation District	0.
Lethbridge Northern Irrig. Dis	0.
Mountain View Et. Al. I.D's	0.
St. Mary River Irrigation Dist	0.
United Irrigation District	0.
Western Irrigation District	0.
TOTAL CONSUMPTIVE USE	1790.

RESERVOIR STORAGE
South Saskatchewan River Basin
Month of February , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	-80.
2.Bearspaw Reservoir	330.
3.Ghost Lake	2720.
4.Glenmore Reservoir	-3050.
5.Lake Minnewanka	-45870.
6.Lower Kananaskis	-8940.
7.St. Mary Reservoir	5340.
8.Spray Lakes	-18550.
9.Upper Kananaskis	-15950.
10.Waterton Reservoir	10.
TOT. CHANGE IN RESERVOIR STORAGE	-84040.

Diversion Into - Red Deer River Basin
Month of February , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	0.
Western Irrigation District	
WID Ret Flow-Red Deer River	0.
Total Diversion Into Basin	0.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of February , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	0.
TOTAL CONSUMPTIVE USE	0.

RESERVOIR STORAGE
Red Deer River
Month of February , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	-21830.
TOT. CHANGE IN RESERVOIR STORAGE	-21830.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of March , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	351000.
Consumptive Use	4100.
Reservoir Storage	-86450.
Routing Adjustment	620.
Diversion from Basin	- 0. + 0.
NATURAL FLOW*: Alta-Sask Boundary	269270.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	115000.
Consumptive Use	0.
Reservoir Storage	-3970.
Routing Adjustment	-10470.
Diversion into Basin	+ 0. - 0.
NATURAL FLOW : Alta-Sask Boundary	100560.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	466000.
NATURAL FLOW	369830.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchewan River Basin
Month of March , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	4100.
Eastern Irrigation District	0.
Lethbridge Northern Irrig. Dis	0.
Mountain View Et. Al. I.D's	0.
St. Mary River Irrigation Dist	0.
United Irrigation District	0.
Western Irrigation District	0.
TOTAL CONSUMPTIVE USE	4100.

RESERVOIR STORAGE
South Saskatchewan River Basin
Month of March , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	-2200.
2.Bearspav Reservoir	600.
3.Ghost Lake	-470.
4.Glenmore Reservoir	1100.
5.Lake Minnevanka	-38870.
6.Lower Kananaskis	-19740.
7.St. Mary Reservoir	1490.
8.Spray Lakes	-21200.
9.Upper Kananaskis	-7770.
10.Waterton Reservoir	610.
TOT. CHANGE IN RESERVOIR STORAGE	-86450.

Diversion Into - Red Deer River Basin
Month of March , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	0.
Western Irrigation District	
WID Ret Flow-Red Deer River	0.
Total Diversion Into Basin	0.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of March , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	0.
TOTAL CONSUMPTIVE USE	0.

RESERVOIR STORAGE
Red Deer River
Month of March , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	-3970.
TOT. CHANGE IN RESERVOIR STORAGE	-3970.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of April , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	406000.
Consumptive Use	57490.
Reservoir Storage	-50040.
Routing Adjustment	-35070.
Diversion from Basin	- 3160. + 3160.
NATURAL FLOW*: Alta-Sask Boundary	381540.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	307000.
Consumptive Use	2930.
Reservoir Storage	-33630.
Routing Adjustment	14740.
Diversion into Basin	+ 3160. - 3160.
NATURAL FLOW : Alta-Sask Boundary	287880.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	713000.
NATURAL FLOW	669420.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchewan River Basin
Month of April , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	33060.
Eastern Irrigation District	18020.
Lethbridge Northern Irrig. Dis	3640.
Mountain View Et. Al. I.D's	0.
St. Mary River Irrigation Dist	5260.
United Irrigation District	0.
Western Irrigation District	-2490.
TOTAL CONSUMPTIVE USE	57490.

NOTE: Negative consumptive use by the district is computed due to excessive rainfall.

RESERVOIR STORAGE
South Saskatchewan River Basin
Month of April , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	-8920.
2.Bearspaw Reservoir	400.
3.Ghost Lake	-21730.
4.Glenmore Reservoir	-1630.
5.Lake Minnewanka	-8630.
6.Lower Kananaskis	-15070.
7.St. Mary Reservoir	21960.
8.Spray Lakes	-16960.
9.Upper Kananaskis	-2590.
10.Waterton Reservoir	3130.
TOT. CHANGE IN RESERVOIR STORAGE	-50040.

Diversion Into - Red Deer River Basin
Month of April , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	1390.
Western Irrigation District	
WID Ret Flow-Red Deer River	1770.
Total Diversion Into Basin	3160.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of April , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	2930.
TOTAL CONSUMPTIVE USE	2930.

RESERVOIR STORAGE
Red Deer River
Month of April , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	-33630.
TOT. CHANGE IN RESERVOIR STORAGE	-33630.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of May , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	816000.
Consumptive Use	252390.
Reservoir Storage	81260.
Routing Adjustment	-42720.
Diversion from Basin	- 18250. + 18250.
NATURAL FLOW*: Alta-Sask Boundary	1125180.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	229000.
Consumptive Use	4130.
Reservoir Storage	62850.
Routing Adjustment	-29320.
Diversion into Basin	+ 18250. - 18250.
NATURAL FLOW : Alta-Sask Boundary	248410.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	1045000.
NATURAL FLOW	1373590.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchewan River Basin
Month of May , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	67590.
Eastern Irrigation District	89240.
Lethbridge Northern Irrig. Dis	21650.
Mountain View Et. Al. I.D's	20.
St. Mary River Irrigation Dist	59740.
United Irrigation District	0.
Western Irrigation District	14150.
TOTAL CONSUMPTIVE USE	252390.

RESERVOIR STORAGE
South Saskatchewan River Basin
Month of May , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	4380.
2.Bearspaw Reservoir	-100.
3.Ghost Lake	9070.
4.Glenmore Reservoir	-530.
5.Lake Minnewanka	14240.
6.Lower Kananaskis	10710.
7.St. Mary Reservoir	30.
8.Spray Lakes	22340.
9.Upper Kananaskis	10190.
10.Waterton Reservoir	10930.
TOT. CHANGE IN RESERVOIR STORAGE	81260.

Diversion Into - Red Deer River Basin
Month of May , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	13440.
Western Irrigation District	
WID Ret Flow-Red Deer River	4810.
Total Diversion Into Basin	18250.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of May , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	4130.
TOTAL CONSUMPTIVE USE	4130.

RESERVOIR STORAGE
Red Deer River
Month of May , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	62850.
TOT. CHANGE IN RESERVOIR STORAGE	62850.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of June , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	2030000.
Consumptive Use	283830.
Reservoir Storage	253080.
Routing Adjustment	-28940.
Diversion from Basin	- 30030. + 30030.
NATURAL FLOW*: Alta-Sask Boundary	2568000.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	946000.
Consumptive Use	2230.
Reservoir Storage	4330.
Routing Adjustment	15540.
Diversion into Basin	+ 30030. - 30030.
NATURAL FLOW : Alta-Sask Boundary	938070.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	2976000.
NATURAL FLOW	3506070.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchevan River Basin
Month of June , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	54480.
Eastern Irrigation District	93070.
Lethbridge Northern Irrig. Dis	36130.
Mountain View Et. Al. I.D's	0.
St. Mary River Irrigation Dist	99820.
United Irrigation District	0.
Western Irrigation District	330.
TOTAL CONSUMPTIVE USE	283830.

RESERVOIR STORAGE
South Saskatchevan River Basin
Month of June , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	-1730.
2.Bearspaw Reservoir	-490.
3.Ghost Lake	2850.
4.Glenmore Reservoir	430.
5.Lake Minnewanka	67810.
6.Lower Kananaskis	19400.
7.St. Mary Reservoir	49180.
8.Spray Lakes	64790.
9.Upper Kananaskis	30690.
10.Waterton Reservoir	20150.
TOT. CHANGE IN RESERVOIR STORAGE	253080.

Diversion Into - Red Deer River Basin
Month of June , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	20740.
Western Irrigation District	
WID Ret Flow-Red Deer River	9290.
Total Diversion Into Basin	30030.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of June , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	2230.
TOTAL CONSUMPTIVE USE	2230.

RESERVOIR STORAGE
Red Deer River
Month of June , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	4330.
TOT. CHANGE IN RESERVOIR STORAGE	4330.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of July , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	708000.
Consumptive Use	541870.
Reservoir Storage	131930.
Routing Adjustment	21600.
Diversion from Basin	- 40820. + 40820.
NATURAL FLOW*: Alta-Sask Boundary	1444220.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	584000.
Consumptive Use	5070.
Reservoir Storage	4970.
Routing Adjustment	2390.
Diversion into Basin	+ 40820. - 40820.
NATURAL FLOW : Alta-Sask Boundary	555610.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	1292000.
NATURAL FLOW	1999830.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchewan River Basin
Month of July , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	76520.
Eastern Irrigation District	130340.
Lethbridge Northern Irrig. Dis	86670.
Mountain View Et. Al. I.D's	2210.
St. Mary River Irrigation Dist	210160.
United Irrigation District	4220.
Western Irrigation District	31750.
TOTAL CONSUMPTIVE USE	541870.

RESERVOIR STORAGE
South Saskatchewan River Basin
Month of July , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	3900.
2.Bearspaw Reservoir	-60.
3.Ghost Lake	5560.
4.Glenmore Reservoir	190.
5.Lake Minnewanka	44170.
6.Lower Kananaskis	14800.
7.St. Mary Reservoir	6100.
8.Spray Lakes	20260.
9.Upper Kananaskis	30000.
10.Waterton Reservoir	7010.
TOT. CHANGE IN RESERVOIR STORAGE	131930.

Diversion Into - Red Deer River Basin
Month of July , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	33160.
Western Irrigation District	
WID Ret Flow-Red Deer River	7660.
Total Diversion Into Basin	40820.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of July , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	5070.
TOTAL CONSUMPTIVE USE	5070.

RESERVOIR STORAGE
Red Deer River
Month of July , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	4970.
TOT. CHANGE IN RESERVOIR STORAGE	4970.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of August , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	382000.
Consumptive Use	395680.
Reservoir Storage	-38330.
Routing Adjustment	20040.
Diversion from Basin	- 32220. + 32220.
NATURAL FLOW*: Alta-Sask Boundary	791610.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	229000.
Consumptive Use	6180.
Reservoir Storage	-1260.
Routing Adjustment	1700.
Diversion into Basin	+ 32220. - 32220.
NATURAL FLOW : Alta-Sask Boundary	203400.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	611000.
NATURAL FLOW	995010.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchewan River Basin
Month of August , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	74600.
Eastern Irrigation District	122420.
Lethbridge Northern Irrig. Dis	32590.
Mountain View Et. Al. I.D's	3800.
St. Mary River Irrigation Dist	133960.
United Irrigation District	4070.
Western Irrigation District	24240.
TOTAL CONSUMPTIVE USE	395680.

RESERVOIR STORAGE
South Saskatchevan River Basin
Month of August , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	3030.
2.Bearspaw Reservoir	90.
3.Ghost Lake	-800.
4.Glenmore Reservoir	5130.
5.Lake Minnewanka	-1270.
6.Lower Kananaskis	4450.
7.St. Mary Reservoir	-33200.
8.Spray Lakes	-3650.
9.Upper Kananaskis	19950.
10.Waterton Reservoir	-32060.
TOT. CHANGE IN RESERVOIR STORAGE	-38330.

Diversion Into - Red Deer River Basin
Month of August , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	24580.
Western Irrigation District	
WID Ret Flow-Red Deer River	7640.
Total Diversion Into Basin	32220.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of August , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	6180.
TOTAL CONSUMPTIVE USE	6180.

RESERVOIR STORAGE
Red Deer River
Month of August , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	-1260.
TOT. CHANGE IN RESERVOIR STORAGE	-1260.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of September, 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	127000.
Consumptive Use	324070.
Reservoir Storage	-99730.
Routing Adjustment	4380.
Diversion from Basin	- 19740. + 19740.
NATURAL FLOW*: Alta-Sask Boundary	375460.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	119000.
Consumptive Use	2790.
Reservoir Storage	1860.
Routing Adjustment	-120.
Diversion into Basin	+ 19740. - 19740.
NATURAL FLOW : Alta-Sask Boundary	103790.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	246000.
NATURAL FLOW	479250.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchewan River Basin
Month of September, 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	70780.
Eastern Irrigation District	90600.
Lethbridge Northern Irrig. Dis	18010.
Mountain View Et. Al. I.D's	3590.
St. Mary River Irrigation Dist	123260.
United Irrigation District	2650.
Western Irrigation District	15180.
TOTAL CONSUMPTIVE USE	324070.

RESERVOIR STORAGE
South Saskatchewan River Basin
Month of September, 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	-970.
2.Bearspaw Reservoir	200.
3.Ghost Lake	-670.
4.Glenmore Reservoir	4490.
5.Lake Minnewanka	9790.
6.Lover Kananaskis	5870.
7.St. Mary Reservoir	-85060.
8.Spray Lakes	-2530.
9.Upper Kananaskis	2000.
10.Waterton Reservoir	-32850.
TOT. CHANGE IN RESERVOIR STORAGE	-99730.

Diversion Into - Red Deer River Basin
Month of September, 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	15790.
Western Irrigation District	
WID Ret Flow-Red Deer River	3950.
Total Diversion Into Basin	19740.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of September, 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	2790.
TOTAL CONSUMPTIVE USE	2790.

RESERVOIR STORAGE
Red Deer River
Month of September, 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	1860.
TOT. CHANGE IN RESERVOIR STORAGE	1860.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of October , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	207000.
Consumptive Use	63070.
Reservoir Storage	-10700.
Routing Adjustment	48590.
Diversion from Basin	- 12510. + 12510.
NATURAL FLOW*: Alta-Sask Boundary	320470.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	76900.
Consumptive Use	440.
Reservoir Storage	8880.
Routing Adjustment	-510.
Diversion into Basin	+ 12510. - 12510.
NATURAL FLOW : Alta-Sask Boundary	73200.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	283900.
NATURAL FLOW	393670.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchewan River Basin
Month of October , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	11360.
Eastern Irrigation District	23030.
Lethbridge Northern Irrig. Dis	6380.
Mountain View Et. Al. I.D's	1050.
St. Mary River Irrigation Dist	23410.
United Irrigation District	1640.
Western Irrigation District	-3800.
TOTAL CONSUMPTIVE USE	63070.

NOTE: Negative consumptive use by the district is computed due to release from internal reservoir.

RESERVOIR STORAGE
South Saskatchewan River Basin
Month of October , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	2040.
2.Bearspaw Reservoir	240.
3.Ghost Lake	6360.
4.Glenmore Reservoir	-1080.
5.Lake Minnewanka	-16190.
6.Lower Kananaskis	-5010.
7.St. Mary Reservoir	45300.
8.Spray Lakes	-8750.
9.Upper Kananaskis	-2430.
10.Waterton Reservoir	-31180.
TOT. CHANGE IN RESERVOIR STORAGE	-10700.

Diversion Into - Red Deer River Basin
Month of October , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	10420.
Western Irrigation District	
WID Ret Flow-Red Deer River	2090.
Total Diversion Into Basin	12510.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of October , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	440.
TOTAL CONSUMPTIVE USE	440.

RESERVOIR STORAGE
Red Deer River
Month of October , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	8880.
TOT. CHANGE IN RESERVOIR STORAGE	8880.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of November , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	298000.
Consumptive Use	1960.
Reservoir Storage	-28590.
Routing Adjustment	5800.
Diversion from Basin	- 0. + 0.
NATURAL FLOW*: Alta-Sask Boundary	277170.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	36800.
Consumptive Use	0.
Reservoir Storage	-7800.
Routing Adjustment	5890.
Diversion into Basin	+ 0. - 0.
NATURAL FLOW : Alta-Sask Boundary	34890.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	334800.
NATURAL FLOW	312060.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

* -- The recorded flow of the St. Mary River at the International Boundary is treated as a natural flow for Apportionment purposes.

CONSUMPTIVE USE
South Saskatchewan River Basin
Month of November , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	1960.
Eastern Irrigation District	0.
Lethbridge Northern Irrig. Dis	0.
Mountain View Et. Al. I.D's	0.
St. Mary River Irrigation Dist	0.
United Irrigation District	0.
Western Irrigation District	0.
TOTAL CONSUMPTIVE USE	1960.

RESERVOIR STORAGE
South Saskatchewan River Basin
Month of November , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	-690.
2.Bearspaw Reservoir	-540.
3.Ghost Lake	-3060.
4.Glenmore Reservoir	-2540.
5.Lake Minnewanka	-18480.
6.Lower Kananaskis	2400.
7.St. Mary Reservoir	18140.
8.Spray Lakes	-15720.
9.Upper Kananaskis	-16180.
10.Waterton Reservoir	8080.
TOT. CHANGE IN RESERVOIR STORAGE	-28590.

Diversion Into - Red Deer River Basin
Month of November , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	0.
Western Irrigation District	
WID Ret Flow-Red Deer River	0.
Total Diversion Into Basin	0.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of November , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	0.
TOTAL CONSUMPTIVE USE	0.

RESERVOIR STORAGE
Red Deer River
Month of November , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	-7800.
TOT. CHANGE IN RESERVOIR STORAGE	-7800.

SUMMARY OF
NATURAL FLOWS, CONSUMPTIVE USE AND STORAGE
IN THE SOUTH SASKATCHEWAN RIVER BASIN
Month of December , 1990

SOUTH SASKATCHEWAN RIVER BASIN	UNITS (CUBIC DECAMETRES)
SOUTH SASKATCHEWAN RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	155000.
Consumptive Use	2040.
Reservoir Storage	-57880.
Routing Adjustment	7990.
Diversion from Basin	- 0. + 0.
NATURAL FLOW*: Alta-Sask Boundary	107150.
RED DEER RIVER AT ALTA-SASK BOUNDARY	
Recorded Discharge	45600.
Consumptive Use	0.
Reservoir Storage	-24850.
Routing Adjustment	1210.
Diversion into Basin	+ 0. - 0.
NATURAL FLOW : Alta-Sask Boundary	21960.
SOUTH SASKATCHEWAN RIVER BELOW RED DEER RIVER	
Recorded Discharge	200600.
NATURAL FLOW	129110.

NOTE: The Routing Adjustment is the integrated correction for travel time from the project sites to the Alberta-Saskatchewan Boundary.

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CONSUMPTIVE USE
South Saskatchewan River Basin
Month of December , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Bow River Irrigation District	2040.
Eastern Irrigation District	0.
Lethbridge Northern Irrig. Dis	0.
Mountain View Et. Al. I.D's	0.
St. Mary River Irrigation Dist	0.
United Irrigation District	0.
Western Irrigation District	0.
TOTAL CONSUMPTIVE USE	2040.

RESERVOIR STORAGE
South Saskatchewan River Basin
Month of December , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
1.Barrier Reservoir	160.
2.Bearspaw Reservoir	40.
3.Ghost Lake	-3590.
4.Glenmore Reservoir	-2460.
5.Lake Minnewanka	-21860.
6.Lower Kananaskis	-2420.
7.St. Mary Reservoir	-850.
8.Spray Lakes	-21530.
9.Upper Kananaskis	-21770.
10.Waterton Reservoir	16400.
TOT. CHANGE IN RESERVOIR STORAGE	-57880.

Diversion Into - Red Deer River Basin
Month of December , 1990

PROJECT NAME	DIVERSION (Cubic Decametres)
Eastern Irrigation District	
EID Ret Flow-Red Deer River	0.
Western Irrigation District	
WID Ret Flow-Red Deer River	0.
Total Diversion Into Basin	0.

NOTE: At present all diversion into the Red Deer River Basin is irrigation return flow diverted originally from the Bow River. The same water is shown as a negative diversion into the South Saskatchewan River Basin.

CONSUMPTIVE USE
Red Deer River Basin
Month of December , 1990

PROJECT NAME (Irrigation District)	CONSUMPTIVE USE (Cubic Decametres)
Red Deer River Basin	0.
TOTAL CONSUMPTIVE USE	0.

RESERVOIR STORAGE
Red Deer River
Month of December , 1990

PROJECT NAME (Reservoir)	Change in storage (Cubic Decametres)
Dickson Reservoir	-24850.
TOT. CHANGE IN RESERVOIR STORAGE	-24850.